Building the blocks of a detector to understand the building blocks of matter

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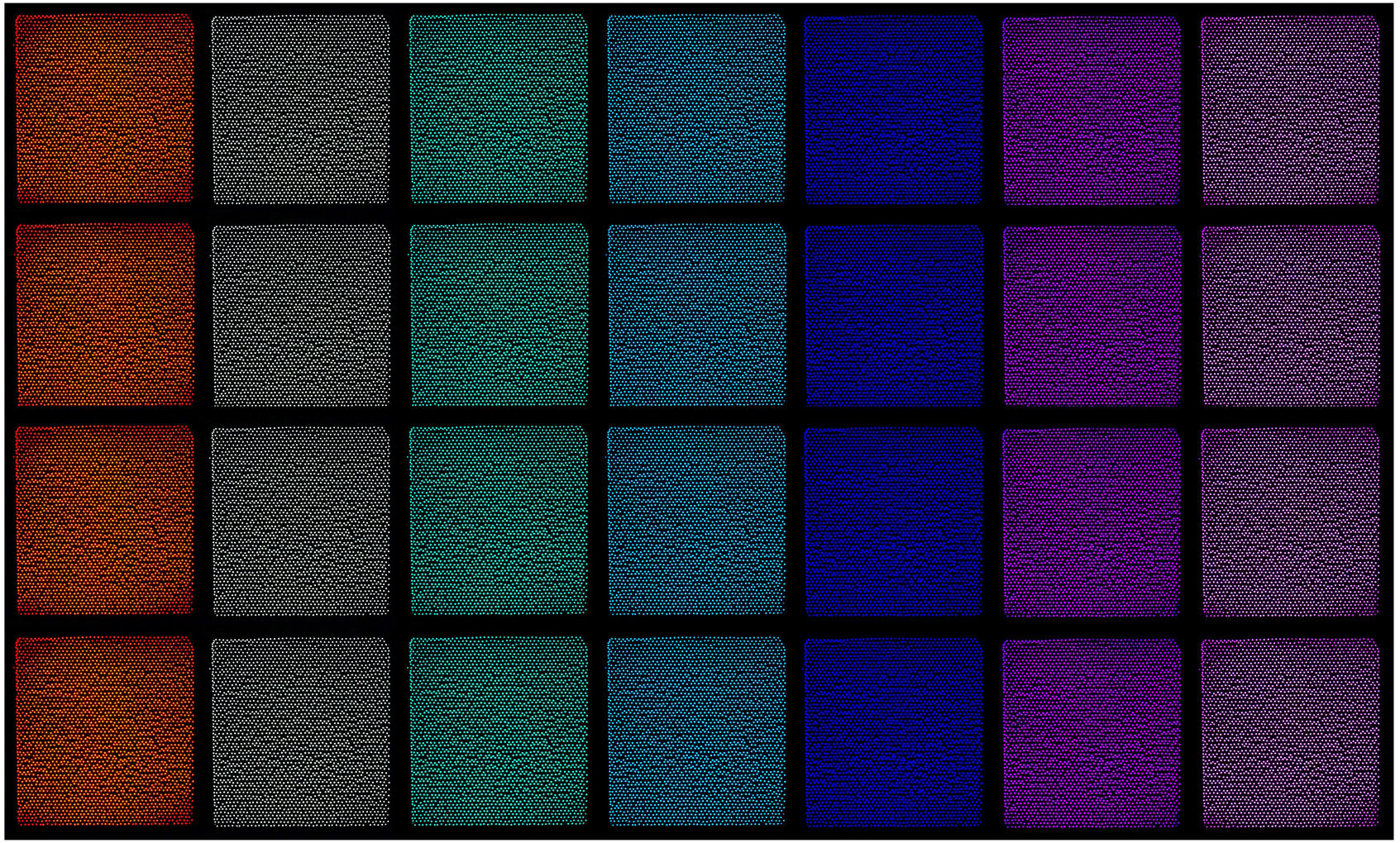

Trying to answer the question “what is matter made of?”, physicist developed instruments called “particle detectors”. Ironically, measuring the smallest particles requires the biggest detectors, and looking into the deepest levels of matter requires detectors as complex as matter itself! We need particle detectors because most particles are invisible. The only particles that the human eye can see are light particles, and their energies are what our eyes interpret as colors. Not being able to see something doesn’t mean it isn’t there, though. We can’t see air, but we can hear the wind blow and can feel the breeze on our skin. It’s the same with most particles: we can’t see them, but we can detect them. Particle detectors are so fascinating that I decided to show part of a detector that I’m helping build. The image shows a transverse view of some blocks that make up the detector. The blocks (colored squares) are a combination of tungsten (the black background) and scintillating fibers (colored dots in each square), and just as human eyes are able to see the different colors of light particles, these detector blocks will be able to “see the different colors” of other particles as well.